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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/460,844	12/14/1999	AMIR HEKMATPOUR	AUS9908343-U	3026

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EXAMINER	
JONES, HUGH M	

ART UNIT	PAPER NUMBER
2128	8

DATE MAILED: 02/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/460,844	Applicant(s) HEKMATPOUR, AMIR
	Examiner Hugh Jones	Art Unit 2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *9/5/2003 and 12/16/2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-29 of U. S. Application 09/460,844, filed 12/14/1999 are presented for examination.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 22 recites the limitation "during designing *of the* ***integrated circuit***" in the last line of the claim. There is insufficient antecedent basis for this limitation in the claim. Dependent claims 23-29 inherit the defect.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-29 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Preist et al.

6. Preist et al. disclose a diagnostic system (10) for diagnosing the root cause of failures of functional tests made on a system under test wherein the system under test comprises a plurality of interacting components and wherein the diagnostic system (10)

comprises means (20) for interpreting test results based on the set of operations which are involved in carrying out the tests and which components are exercised by operations. See figure 1. Preist et al. further disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or unobviousness.

9. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Loopik et al. in view of Preist et al.*.

10. Loopik et al. disclose circuit assembly testing systems and systems and methods for debugging circuit test systems and diagnosing faults in circuit assemblies. ***An expert system derives possible root causes of test failures, predicts test results based on these possible root causes and uses factual observations to refute inconsistent hypothetical root causes. Tests useful in refuting inconsistent hypothetical root causes are devised and run automatically by the system.*** See figures 1-8 and corresponding text.

11. Loopik et al. do not expressly disclose the use of fuzzy/Bayesian inference techniques.

12. Preist et al. disclose a diagnostic system (10) for diagnosing the root cause of failures of functional tests made on a system under test wherein the system under test comprises a plurality of interacting components and wherein the diagnostic system (10) comprises means (20) for interpreting test results based on the set of operations which are involved in carrying out the tests and which components are exercised by operations. See figure 1. Preist et al. further disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12).

13. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of fuzzy/Bayesian inference engines to the teachings of Loopik et al. because Preist et al. disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12) in the context of determination of root cause of faults in IC design.

14. Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kirsch et al. in view of Preist et al..*

15. Kirsch et al. disclose applying Bayesian networks to fault diagnosis. They further disclose that diagnosis applications relying on artificial intelligence methods must deal with uncertain knowledge and fuzzy input data. Besides other methods, classical probability theory has been realized by many authors to be useful for such tasks, given that tools are available, making its application more handy. One such tool are Bayesian networks (causal probabilistic networks, belief networks). While the construction of the graph of a Bayesian network along causal dependencies is often quite easy, it is usually difficult to specify the necessary probabilities, i.e. for every node the probabilities that its variable assumes a certain value given the predecessors' values. Instead, in practical applications, it is usually preferable to specify an unordered set of conditional probabilities, which does not necessarily match the set of probabilities in the network. Such a set of probabilities has the potential problem of being neither consistent nor complete with respect to the compound distribution of all random variables in the net. It is shown, that a test for consistency and completeness and answering queries about the compound probability can in general be done by solving a nonlinear equation system. See section 2 (Bayesian networks); sections 3-4.

16. Kirsch et al. do expressly disclose the use of fuzzy/Bayesian inference techniques, but do not expressly disclose that the application is to IC design.

17. Preist et al. disclose a diagnostic system (10) for diagnosing the root cause of failures of functional tests made on a system under test wherein the system under test comprises a plurality of interacting components and wherein the diagnostic system (10) comprises means (20) for interpreting test results based on the set of operations which

are involved in carrying out the tests and which components are exercised by operations. See figure 1. Preist et al. further disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12).

18. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of fuzzy/Bayesian inference engines to the teachings of Kirsch et al. because Preist et al. disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12) in the context of determination of root cause of faults in IC design.

19. Claims 16-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Loopik et al. in view of Preist et al.*.

20. Loopik et al. disclose circuit assembly testing systems and systems and methods for debugging circuit test systems and diagnosing faults in circuit assemblies. ***An expert system derives possible root causes of test failures, predicts test results based on these possible root causes and uses factual observations to refute inconsistent hypothetical root causes. Tests useful in refuting inconsistent hypothetical root causes are devised and run automatically by the system***. See figures 1-8 and corresponding text.

21. Loopik et al. do not expressly disclose the use of fuzzy/Bayesian inference techniques.

22. Preist et al. disclose a diagnostic system (10) for diagnosing the root cause of failures of functional tests made on a system under test wherein the system under test comprises a plurality of interacting components and wherein the diagnostic system (10) comprises means (20) for interpreting test results based on the set of operations which

are involved in carrying out the tests and which components are exercised by operations. See figure 1. Preist et al. further disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12).

23. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of fuzzy/Bayesian inference engines to the teachings of Loopik et al. because Preist et al. disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12) in the context of determination of root cause of faults in IC design.

24. Loopik et al. further do not expressly disclose the *matrix* operations, as claimed.

25. At the time of the invention, it would have been an obvious matter of design choice to a person of ordinary skill in the art to consider matrix operations because Applicant has not disclosed that using the matrix provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the applied prior art because the use of a matrix would not affect the teachings of the applied prior art. Therefore, it would have been an obvious matter of design choice to modify the applied prior art to obtain the invention as specified in the claims.

26. Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quintero et al. in view of *Preist et al.*.

27. Quintero et al. disclose an expert system for use in designing a connected collection of components which are available or can be made in different forms, e.g. which can be described by a selected number of variables. The expert system includes a knowledge base and an inference engine. The knowledge base includes records

pertaining to constant and variable characteristics of connectable components and rules for combining a component with other components. The inference engine allows selecting a record for a first component, then a record for only those second components which can be connected to the first component, and storing information about the connections. See col. 2, lines 9-42; col. 7, line 1 to col. 10, line 62.

28. Quintero et al. disclose all limitations and features, but does not expressly disclose that the intended use is for integrated circuits, and further does not disclose the use of fuzzy/Bayesian inference engines.

30. Preist et al. disclose a diagnostic system (10) for diagnosing the root cause of failures of functional tests made on a system under test wherein the system under test comprises a plurality of interacting components and wherein the diagnostic system (10) comprises means (20) for interpreting test results based on the set of operations which are involved in carrying out the tests and which components are exercised by operations. See figure 1. Preist et al. further disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12).

31. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of fuzzy/Bayesian inference engines to the teachings of Loopik et al. because Preist et al. disclose the use of fuzzy and Bayesian inference (lines 37-59, col. 12) in the context of determination of root cause of faults in IC design.

Response to Arguments

32. Applicant's arguments filed 9/5/2003 (paper # 4) have been fully considered but they are not persuasive.

***Response to Arguments - 101 Rejections* (pg. 6; paper # 4)**

33. The 101 rejections are withdrawn in view of the amendment. Applicants have made no arguments. Applicants are thanked for the amendment.

***Response to Arguments – Double Patenting Rejections* (pg. 6; paper # 4)**

34. The double patenting rejections are withdrawn in view of the Terminal Disclaimer (paper # 7). Applicants have made no arguments. Applicants are thanked for the Terminal Disclaimer.

***Response to Arguments – Prior Art Rejections* (pp. 8-10; paper # 4)**

35. Applicant's arguments are moot in view of the new rejections that have been applied against the amended claims.

Conclusion

36. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

37. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

38. Any inquiry concerning this communication or earlier communications from the examiner should be:

directed to:

Dr. Hugh Jones telephone number (703) 305-0023, Monday-Thursday 0830 to 0700 ET, ***or*** the examiner's supervisor, Kevin Teska, telephone number (703) 305-9704. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 308-9051 (for formal communications intended for entry)

or (703) 308-1396 (for informal or draft communications, please label "*PROPOSED*"or "*DRAFT*").

Dr. Hugh Jones

Primary Patent Examiner

February 15, 2004

HUGH JONES Ph.D.
PRIMARY PATENT EXAMINER
TECHNOLOGY CENTER 2100